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STUDENT OUTLINE

MEPS GENERATOR CHARACTERISTICS AND INSTRUMENTATION

1. **LEARNING OBJECTIVES:**

a. **Terminal Learning Objective:**

(1) Provided a generator set, a mechanic's tool box, and the reference, operate the generator set, so that it will apply voltage to appropriate equipment per the reference. (1141.02.02)

(2) Provided a schematic, a faulty generator set electrical system, and applicable tools and test equipment, with the aid of references, repair the generator set electrical system so that it functions properly in accordance with the appropriate equipment technical manual. (1142.01.03)

b. **Enabling Learning Objectives**:

(1) Provided a list of generators and a selection of generator characteristics, identify the correct characteristics for each generator, in accordance with the applicable Technical Manual. (1141.02.02c) (1142.01.03ad)

(2) Provided a list of generator instruments and a selection of instrument functions, without the aid of references, identify the correct function for each instruments, in accordance with the applicable Technical Manual. (1141.02.02d) (1142.01.03ae)

BODY

1. **Generator Set Characteristics**:

a. There are two different classifications of generators, they are Utility class and Precise class generators.

(1) The Utility Class Generators are utilized to supply power to standard electrical equipment such as lights, receptacles and machinery that do not require an exact calibrated frequency.

(2) The Precise Class Generators are utilized to provide power to electrical equipment that requires an exact calibrated frequency such as radar and communications equipment.

b. MEP-016B Utility Class Generator.

(1) Diesel Engine driven.

(2) Tactical skid mounted.

(3) 3,000 watts or 3 kW.

(4) The output AC voltages of this unit are 3-phase 120/208 volts, 3-phase 120 volts, single phase 120 volts and single phase 240 volts.

(5) The engine is air-cooled.

(6) The frequency is 60 hertz.

c. MEP-021B Utility Class Generator is an exact duplicate of the MEP-016B with the exception of the frequency, which is rated at 400 hertz.

d. MEP-003A Utility Class Generator.

(1) Diesel engine driven.

(2) Tactical skid mounted.

(3) 10,000 watts or 10 kW.

(4) The output AC voltages of this unit are 3-phase 120/208 volts, 3-phase 120 volts, single phase 120 volts and single phase 240 volts.

(5) The engine is air-cooled.

(6) The frequency is 60 hertz.

e. MEP-112A Utility Class Generator is the exact duplicate of the MEP-003A with the exception of the frequency, which is rated at 400 hertz.

f. MEP-005A utility class generator.

(1) Diesel Engine driven.

(2) Tactical skid mounted.

(3) 30,000 watts or 30 kW.

(4) The output AC voltages of this unit are 3-phase, 4 wire, 120/208 volts and 240/416 volts.

(5) The engine is water-cooled.

(6) The frequency is 50/60 hertz.

g. MEP-114A Precise Class Generator is an exact duplicate of the MEP-005A with the exception of the frequency, which is rated at 400 hertz.

h. MEP-006A Utility Class Generator.

(1) Diesel engine driven.

(2) Tactical skid mounted.

(3) 60,000 watts or 60 kW.

(4) The output AC voltages of this unit are 3-phase, 4 wire, 120/208 volts and 240/416 volts.

(5) The engine is water-cooled.

(6) The frequency is 50/60 hertz.

i. MEP-115A Precise Class Generator is an exact duplicate of the MEP-006A with the exception of the frequency which is rated at 400 hertz.

j. MEP-007A/ B Utility Class Generator.

(1) Diesel Engine driven.

(2) Tactical skid mounted.

(3) 100,000 watts or 100 kW.

(4) The output AC voltages of this unit are 3-phase, 4 wire, 120/208 volts and 240/416 volts.

(5) The engine is water-cooled.

(6) The frequency is 50/60 hertz.

k. MEP-009A Utility Class Generator.

(1) Diesel Engine driven.

(2) Tactical skid mounted.

(3) 200,000 watts or 200 kW.

(4) The output AC voltages of this unit are 3-phase, 4 wire, 120/208 volts and 240/416 volts.

(5) The engine is water-cooled.

(6) The frequency is 50/60 hertz.

GEN	KW	HZ	AC OUTPUT	CLASS
MEP-016	3	60	120 or 240, 120/208	Utility
MEP-003	10	60	120 or 240, 120/208	Utility
MEP-005	30	50/60	120/208, 240/416	Utility
MEP-006	60	50/60	120/208, 240/416	Utility
MEP-007	100	50/60	120/208, 240/416	Utility
MEP-009	200	50/60	120/208, 240/416	Utility
MEP-021	3	400	120 or 240, 120/208	Utility
MEP-112	10	400	120 or 240, 120/208	Utility
MEP-114	30	400	120/208, 240/416	Precise
MEP-115	60	400	120/208, 240/416	Precise

2. **Instrumentation:**

a. The control panel houses the various controls and instruments used to operate the generator set.

b. The panel lights illuminate the control panel for nighttime operations.

c. The air cleaner condition indicator illuminates when the air cleaner filters are dirty or faulty.

d. The oil pressure gauge indicates engine oil pressure in pounds per square inch (PSI).

e. The coolant temperature gauge monitors the coolant temperature on a scale from 120 degrees to 240 degrees F.

f. The fuel level gauge indicates the level of fuel in the main fuel tank. The gauge is broken down into quarters ranging from empty (E) to full (F).

g. The battery-charging ammeter indicates the level of battery charging current on a scale of -10 amps to +20 amps. Normal readings are in the green and low readings are in the red.

h. The running time meter indicates the total number of hours of operations of the generator set up to 9999.9. The hours are accumulated in 1/10 of an hour or every six minutes.

i. The engine primer switch allows a metered amount of ether to be sprayed into the intake manifold to assist in cold weather starting. The switch can only be activated when the start-run-stop switch is in the start position. Do not check the switch prior to operation when the battle short is on.

j. The Start-Run-Stop switch controls engine operation and initiates the start sequence.

k. The kilowatt meter indicates the electrical output of the generator set from 0% to 133%.

l. The AC ammeter indicates the amount of output current per phase as selected by the ammeter/voltmeter selector switch from 0% to 133%.

m. The frequency meter indicates the generator frequency of voltage in hertz.

n. The ammeter/ voltmeter selector switch selects the phase to be monitor by the ammeter and voltmeter.

o. The AC voltmeter indicates the voltage as selected by the ammeter/voltmeter selector switch from 0 to 500 volts.

p. The synchronizing lights match the frequency of two or more generator sets when paralleling units.

q. The AC load contactor switch permits opening and closing the AC load contactor. It is, also, know as the circuit breaker switch.

r. The AC load contactor indicator illuminates when the AC load contactor switch is closed.

s. The battle short indicator illuminates when the battle short is activated.

t. The battle short switch permits all generator set faults to be bypassed except engine over-speed and short circuit for emergency operation when authorized by higher authority. The Red Guard prevents accidental activation of the battle short.

u. The panel light switch applies DC power to the panel lights.

v. The voltage-sensing switch allows the unit to be operated by remote control. The switch has two positions local and remote.

w. The mode selector switch is used to select parallel or single unit operation.

x. The DC control circuit breaker protects the controls circuits energized by the batteries. It also permits emergency stoppage of the generator set.

y. The manual speed control permits engine speed adjustment on the utility generator sets.

z. The paralleling receptacles are used only on the precise generator sets. A shorting plug has been installed to allow the unit to be paralleled without the use of the receptacles on the utility units.

aa. The convenience receptacles are standard outdoor duplex receptacles that are protected by a 15 amp push style circuit breaker.

bb. The voltage adjust rheostat adjusts the generator sets output voltage. To adjust turn clockwise to increase and counterclockwise to decrease the voltage output. This is used on the MEP-003s and MEP-016s.

cc. The master switch controls engine operations for MEP-003s and MEP-016s. The switch rotates in five positions Preheat, Off, Prime & Run Aux. Fuel, Prime & Run, and Start.

dd. The fault indicator panel has a series of lights to troubleshoot the generator set while in operation.

(1) The low oil pressure indicator illuminates when the oil pressure falls below 20 PSI +/-.

(2) The coolant temperature indicator illuminates when the engine coolant temperature exceeds 222 degrees F +/- 3 degrees.

(3) The over-speed indicator illuminates if engine RPM exceeds 2450.

(4) The no fuel indicator illuminates when the day tank contains only enough fuel for one minute of operations.

(5) The short circuit indicator illuminates with the activation of the short circuit protective device.

(6) The overload indicator illuminates when the load on any phase reaches 110% of the rated load causing the overload protective device to activate.

(7) The under voltage and under frequency indicators are used on the precise generator sets only and do not apply to the utility sets.

(8) The reverse power indicator illuminates when the reverse power exceeds 20% of the rated valve.

(9) The over voltage indicator illuminates if output voltage exceeds 153 volts +/- 3 volts.

(10) The fault indicator fuse protects the fault indicator circuits from overload. It has a one-amp rating.

(11) The test or reset switch permits testing the fault indicator panel to ensure that all of the lights illuminate properly. It also allows the fault indicator panel to be reset after illumination of one of the indicator lights.

Reference:

TM 00038G/07499A